



### **REMARKS**

This communication is a full and timely response to the aforementioned final Office Action, dated June 21, 2006. Claims 1- 25 are pending in the application. Reconsideration and allowance are respectfully requested in view of the following remarks.

#### **Claim Rejections – 35 U.S.C. §103(a)**

##### **A. Claims 1-5, 7-9, 14-16, 23 and 24**

Claims 1-5, 7-9, 14-16, 23 and 24 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hubacek (U.S. Patent No. 6,475,336) ("Hubacek ") in view of Masuta et al. (U.S. Patent No. 6,277,008) ("Masuta"). Applicants respectfully traverse this rejection.

#### **Legal Standard for 35 U.S.C. § 103**

As stated in MPEP § 2143, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim features. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The mere fact that references can be combined or modified does not render

the resultant combination obvious unless the references also suggest the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

In general, rejections under 35 U.S.C. §103 must be based on "evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness." *In re Lee*, 277 F3d 1338, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002). A showing of a suggestion, teaching, or motivation to combine the prior art references is an essential component of an obviousness holding and "particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed." *Id.* (emphasis added). Moreover, the Patent Office "must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination." *Id.*

In applying 35 U.S.C. § 103, the Federal Circuit has articulated that "hindsight reconstruction" of the claimed invention is impermissible, absent a motivation for combination. To prevent hindsight reconstruction, the Federal Circuit requires that "the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claim invention, would select the element from the cited prior art references for combination in the same manner." *In re Rouffet*, 47 USPQ.2d 1453, 1457-58 (Fed. Cir. 1998) (emphasis added). Moreover, it is necessary "to consider the thinking of one of ordinary skill in the art at the time of the invention and guided only by the prior art references and then-accepted wisdom in the field" *In re Kotzab*, F3d, 55 USPQ2d 1313, 1316 (Fed. Cir. 2000) (emphasis added). Furthermore, in applying 35 U.S.C. § 103, "we do not 'pick and choose among individual elements of assorted prior art references to

recreate the claimed invention,' but rather we look for look for 'some teaching or motivation to support their uses in a particular claimed combination'" *Symbol Technologies Inc. v. Opticon Inc.*, 19 USPQ2d 1241, 1246 (Fed. Cir. 1991).

### **Claimed Subject Matter**

Claim 1 recites a temperature-controlled hot edge ring assembly adapted to surround a semiconductor substrate support in a plasma reaction chamber, the assembly comprising: a conductive lower ring; a ceramic intermediate ring, the intermediate ring overlying the lower ring, the intermediate ring adapted to be attached via the lower ring to an RF electrode; and an upper ring, the upper ring overlying the intermediate ring, wherein the upper ring has an upper surface exposed to an interior of a plasma reaction chamber (emphasis added).

Claim 16 recites a plasma processing apparatus comprising: a processing chamber; a power source which energizes process gas in an interior of the processing chamber into a plasma state for processing a substrate; a substrate support which supports a substrate within the interior of the processing chamber; a conductive lower ring; a ceramic intermediate ring, the intermediate ring overlying the lower ring, the intermediate ring adapted to be attached via the lower ring to an RF electrode; and an upper ring, the upper ring overlying the intermediate ring, wherein the upper ring has an upper surface exposed to an interior of a plasma reaction chamber (emphasis added).

### **Examiner's Position**

The Official Action cites Masuta for disclosure of a lower conductive ring and alleges that it would have been obvious to include the conductive ring in the

Hubacek ring arrangement (Official Action, page 2, ¶ 3). Applicants respectfully disagree.

### **Impermissible Hindsight**

First, Applicants respectfully submit that the Official Action uses "hindsight reconstruction" to "pick and choose among individual elements of assorted prior art references to recreate the claimed invention without the requisite motivation." As discussed below, Masuta does not provide substantial evidence in support of the alleged motivation to modify Hubacek. Moreover, the Official Action has not provided any reasoning as to why a skilled artisan with no knowledge of the claimed invention would look to Masuta, which is related to chemical mechanical polishing, to solve a problem related to plasma etching. Accordingly, the rejection is based on impermissible hindsight and should be withdrawn.

### **Improper Motivation**

Second, the Official Action further states that "[t]he motivation to construct the ring of Hubacek with the lower conductive ring of Masuta is that the lower conductive portion provides more mechanical strength to the overall ring and allows for greater throughput" (emphasis added) (Official Action at pages 2-3). As discussed previously, an obviousness rejection must be based on "evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness." *In re Lee*, 277 F3d 1338, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002) (emphasis added). Furthermore, the Patent Office must "identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination." *Id.* However, there is no basis in the cited references to support the Examiner's allegation that increasing strength of Hubacek's

hot edge ring would somehow increase wafer plasma etching "throughput," as asserted in the Official Action.

Hubacek relates to a method for plasma etching semiconductor substrates (column 1, lines 7-10). Hubacek does not use the hot edge ring assembly for chemical mechanical polishing and the hot edge ring is not subjected to any rotational forces or pressure associated with chemical mechanical polishing, requiring coupling ring **17** and edge ring **18** to possess increased mechanical strength in the plasma etching apparatus in which the coupling ring **17** and edge ring **18** are used. For at least this reason, Applicants respectfully submit that the Official Action fails to provide any "teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness " in support of the alleged motivation to modify Hubacek.

Because a *prima facie* case of obviousness has not been established, Applicants respectfully request withdrawal of the rejection of claims 1 and 16 under 35 U.S.C. §103(a). Dependent claims 2-5, 7-9, 14-15, 23 and 24 are also patentable over the applied combination of references at least for the same reasons as those discussed above regarding claims 1 and 16.

### **Nonanalogous Art**

As stated in MPEP § 2141.01(a), the examiner must determine what is "analogous prior art" for the purpose of analyzing the obviousness of the subject matter at issue. In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 1443, 1446, 24 USPQ2d 1443,

1445 (Fed. Cir. 1992). Masuta is not in the field of plasma etching and because Masuta relates to chemical mechanical polishing, Masuta is not reasonably pertinent.

Although the Official Action has provided no evidence in support of the alleged motivation to combine Hubacek with Masuta, the rejection is also traversed on the basis that Masuta is nonanalogous art. Applicants respectfully submit that Masuta, which relates to a chemical mechanical polishing apparatus (column 1, lines 5-6) is not in the field of the claimed subject matter. Masuta discloses that "retainer ring **101** holds the substrate **105** and prevents lateral shift of the substrate **105**" (column 3, lines 35-36) during chemical mechanical polishing on rotating polishing table **110** (column 3, lines 30-31, lines 42-51). Masuta further discloses that retaining ring **101** is brought into contact with polishing pad **102** under a pressure of 7 psi (column 3, line 67; column 4, lines 1-2) and that the mechanical strength of retainer ring **101** is increased when it contains metal portion **101b** (column 4, lines 3-8). As such, Masuta is not in the field of Applicants' endeavor. Applicants further submit that Masuta is not reasonably pertinent to the particular problem with which the inventor was concerned, improving uniformity and reducing etch rate drift at the edge of a wafer during plasma processing of semiconductor substrates such as wafers (specification, paragraph **[0015]**; Figure 5). As such, nonanalogous Masuta has been improperly combined with Hubacek. Accordingly, for the additional reason that Masuta is nonanalogous prior art, the rejection should be withdrawn.

#### **B. Claims 6 and 17**

Claims 6 and 17 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hubacek and Masuta and further in view of Zuniga et al. (U.S. Patent No. 6,251,215) ("Zuniga"). Applicants respectfully traverse this rejection.

The Official Action acknowledges that Hubacek and Masuta do not teach the claim features recited in claims 6 and 17, but cites Zuniga to allegedly cure the deficiencies of Hubacek and Masuta (Official Action, at page 5, ¶ 4). However, Zuniga fails to cure the above noted deficiencies regarding the combination of Hubacek and Masuta, with respect to Claims 1 and 16. Accordingly, Applicants respectfully submit that Claims 6 and 17 are patentable over the applied references for at least the same reasons as those discussed above regarding Claims 1 and 16.

Because a *prima facie* case of obviousness has not been established, Applicants respectfully request withdrawal of the rejection of Claims 6 and 17 under 35 U.S.C. §103(a).

**C. Claims 10-13, 17, and 22**

Claims 10-13, 17 and 22 were rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Hubacek and Masuta, and further in view of Koai et al. (U.S. Patent No. 6,159,299) ("Koai"). Applicants respectfully traverse this rejection.

The Official Action acknowledges that Hubacek and Masuta do not teach the claim features recited in Claims 10-13, 17 and 22, and cites Koai to allegedly cure the deficiencies of Hubacek and Masuta (Official Action, at pages 6-7). However, Zuniga fails to cure the above-described deficiencies regarding the combination of Hubacek and Masuta, with respect to Claims 1 and 16. Accordingly, Applicants respectfully submit that Claims 10-13, 17 and 22 are patentable over the applied references for at least the same reasons as those discussed above regarding Claims 1 and 16.

Because a *prima facie* case of obviousness has not been established, Applicants respectfully request withdrawal of the rejection of Claims 10-13, 17 and 22 under 35 U.S.C. §103(a).


**Conclusion**

For at least the foregoing reasons, Applicants respectfully submit that all pending claims are allowable, and this application is in condition for allowance. Accordingly, Applicants request a favorable examination and consideration of the instant application. Should Examiner MacArthur wish to discuss this application, Applicants request that the undersigned be contacted at the number below.

Respectfully submitted,

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